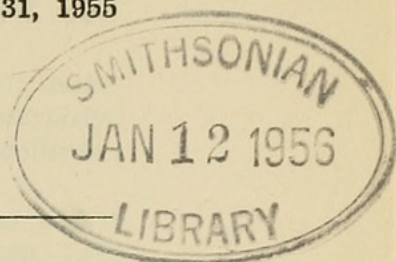


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THREE NEW RODENTS OF THE GENERA MICROMYS
AND APODEMUS FROM KOREA

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The study of a collection of mammals from southern Korea and Cheju Do (Quelpart Island) has revealed the existence there of three new murine rodents, one in the genus *Micromys* and two in the genus *Apodemus*.

A systematic study of Korean mammals is being conducted at the United States National Museum in cooperation with the Commission on Hemorrhagic Fever of the Armed Forces Epidemiological Board and the Army Medical Service Graduate School. This paper represents the first contribution from the cooperative venture.

All measurements are in millimeters. Basal length was taken from the anterior inferior border of the foramen magnum to the anteriormost point on the incisors. Capitalized color terms are from Ridgway (1912).

Micromys minutus hertigi, new subspecies

Type.—Adult female in summer pelage, skin and skull, United States National Museum no. 299104, from 2 miles southeast of Mosulp'o, 3 meters, Cheju Do (Quelpart Island), Korea; obtained 11 September 1954 by Warren D. Thomas, original no. 1675 of J. Knox Jones, Jr.

Distribution.—Known only from the type locality.

Diagnosis.—Upper parts bright ochraceous; skull large; nasals long, slender and tapering posteriorly; zygomatic notch deep.

Description.—Size: Large for species (see measurements); tail longer than head and body. Color: Upper parts (summer pelage) uniformly bright ochraceous (between Ochraceous-Tawny and Ochraceous-Orange), finely lined with black hairs; flanks slightly paler in color, bases of hairs gray; lateral line near Ochraceous-Buff; underparts white; feet pale yellow above, slightly darker below; ears essentially same as dorsum; tail sparsely haired and bicolor, dark above, pale yellowish below; vibrissae black. Skull: Large, massive and relatively narrow (see measurements); nasals long, slender and tapering posteriorly; rostrum broad across nasolachrymal capsules; zygomatic region massive, arches relatively narrow and constricted slightly across jugals; zygomatic notch (at anterior opening of infraorbital foramen as viewed from above) deep; zygomatic processes of maxillae and squamosals broad and massive in lateral view; braincase and interorbital region

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Table 1. Cranial measurements of several subspecies of *Micromys minutus*

	Ocipitonasal length	Nasal length	Basal length	Zygomatic breadth	Breadth of braincase	Depth of braincase	Palatal length	Length of upper molariform toothrow	Length of lower molariform toothrow	Interorbital breadth
<i>Micromys minutus hertigi</i> , 2 mi. SE Mosulp'o, Cheju Do, Korea										
USNM 299103 ♂	21.5	7.1	17.2	10.0	9.7	6.1	10.0	3.3	3.0	3.8
USNM 299104 ♀ (type)					9.8	6.3			3.1	
<i>Micromys minutus ussuricus</i> , various localities in central Korea										
Average 7 (2 ♂, 5 ♀)	19.5	6.0*	16.1	9.4*	9.2	6.1	9.5	3.2	3.0	3.4
Minimum	18.8	5.7	15.5	9.3	9.0	5.6	9.2	3.0	2.8	3.2
Maximum	20.1	6.5	17.2	9.6	9.4	6.3	9.9	3.4	3.1	3.6
<i>Micromys minutus ussuricus</i> , 5 mi. W Kwangju, Korea										
USNM 299100 ♂	19.2	6.5	15.9	9.4	9.2	6.3	9.4	3.1	2.8	3.4
USNM 299101 ♂		6.9		9.8	9.4		9.9	3.2	2.9	3.5
<i>Micromys minutus pygmaeus</i> , Yochow, Hunan, China										
USNM 239537 ♀	21.1	6.9	17.3	9.8	9.3	6.7	10.2	3.2	3.0	3.7
USNM 239539 ♀	20.0	6.6	16.1	9.9	9.4	6.4	9.7	3.1	3.0	3.3

*6 specimens

broad; braincase relatively shallow; toothrows relatively short; mesopterygoid fossa narrow, pterygoids not especially divergent posteriorly; incisive foramina narrow, not reaching level of molariform toothrow; auditory bullae only moderately inflated.

Measurements.—External measurements of the type specimen and a young adult male are, respectively, as follows: Total length, 160, 147; length of tail vertebrae, 84, 81; length of hind foot, 18, 17; length of ear from notch, 10, 10. For cranial measurements see Table 1.

Comparisons.—From *Micromys minutus ussuricus* of the adjacent Korean mainland (specimens from various localities in central and southern Korea), *M. m. hertigi* differs in: Dorsal coloration, in comparable pelages, conspicuously brighter ochraceous, especially mid-dorsally; skull larger in all measurements taken (especially breadth of braincase, occipitonasal and nasal lengths, and zygomatic and interorbital breadths) except depth of braincase and length of toothrows; zygomatic notch deeper; zygomatic processes of maxillae and squamosals broader and more massive; nasals narrower and more tapering posteriorly; mesopterygoid fossa relatively narrower, pterygoids less divergent posteriorly. From *Micromys minutus pygmaeus* of central and southern China (specimens from Yochow, Hunan), *M. m. hertigi* differs in: Dorsal coloration brighter ochraceous; occipitonasal length, nasal length and zygomatic breadth greater; braincase much broader but not so deep; zygomatic notch deeper; nasals narrower; pterygoids less divergent posteriorly.

Remarks.—*M. m. hertigi* seemingly differs from all other described races of *Micromys minutus* in the Orient in generally larger cranial size, a deeper zygomatic notch, broader braincase and brighter ochraceous dorsal coloration. We have seen no specimens of *Micromys minutus aokii* of Tsushima Island or *Micromys minutus japonicus* of southern Japan. However, judging from the descriptions and measurements given by Kuroda (1922:43-44 and 1933:243-244) and measurements listed by Imaizumi (1949:264), both differ from *hertigi* in much the same manner as does *ussuricus*, that is to say, in smaller cranial dimensions and duller ochraceous dorsal pelage. Additional measurements of *M. m. pygmaeus* from South China are listed by Allen (1940:963-964).

Specimens from the Korean mainland are uniformly darker in dorsal coloration than *hertigi* save for a specimen from Songu-ri which approaches it in color. An adult male from 5 miles west of Kwangju, southwestern Korea, approaches *hertigi* in some cranial measurements.

We know of no previous report of harvest mice from Quelpart Island. The subspecies herein described is presumed to occur throughout the island in suitable habitat. Both specimens were trapped in rank grass along an improvised airstrip within sight of the East China Sea. Traps were baited with rolled oats. Patronymic recognition is accorded Dr. Marshall Hertig, Director, Commission on Hemorrhagic Fever, Armed Forces Epidemiological Board, without whose cooperation and understanding our Korean collections could not have been gathered.

Specimens examined.—Two, from the type locality (USNM 299103 and 299104).

Apodemus agrarius pallescens, new subspecies

Type.—Adult female in summer pelage, skin and skull, United States National Museum no. 299161, from 8 miles southwest of Kunsan, 10

meters, Korea; obtained 26 September 1954 by J. Knox Jones, Jr., original no. 1713.

Distribution.—Coastal areas of southern and southwestern Korea.

Diagnosis.—Upper parts drab ochraceous, sides pale ochraceous; dark dorsal stripe pale and indistinct; size, both external and cranial, relatively large.

Description.—Size: Large among subspecies of *agrarius* from the eastern Asiatic mainland, tail shorter than head and body; hind feet and ears moderately large (see measurements). Color: Upper parts (summer pelage) near Light Ochraceous-Buff, lined with black and giving an overall drab ochraceous appearance; sides somewhat paler in color; dorsal stripe indistinct; feet pale yellowish-white above, darker below; ears light brownish with anterior fringe of Ochraceous-Buff hairs; tail indistinctly bicolor, pale brownish above, lighter below; underparts grayish-white. Skull: Relatively large (see measurements), similar to *A. a. coreae*; zygomatic and interorbital regions relatively broad; zygomatic arches rather straight in jugal area as viewed from above, usually broadest across processes of squamosals; incisive foramina slightly expanded posteriorly; auditory bullae moderately inflated; rostrum somewhat shortened; interparietal bone broad; supraorbital ridges well developed; mesoterygoid fossa wide, pterygoids divergent posteriorly.

Measurements.—External and cranial measurements of the type specimen, followed by average and extreme measurements of eight other adults (five males and three females) from the type locality, are as follows: Total length, 205, 205.1 (195-217); length of tail vertebrae, 90, 90.0 (79-94); length of hind foot, 22, 22.0 (21-23); length of ear from notch, 14, 14.4 (14-15); occipitonasal length, 28.8, 27.9 (27.1-29.0); basal length, 24.5, 23.9 (23.4-25.0); zygomatic breadth, 13.7, 13.0 (12.5-13.5); interorbital breadth, 4.5, 4.5 (4.3-4.8); depth of braincase, 8.4, 8.2 (7.9-8.4); length of incisive foramina, 5.6, 5.6 (5.3-6.0); length of upper molariform toothrow, 4.1, 4.3 (4.1-4.4); length of nasals, 10.8, 10.5 (10.1-10.9).

Comparisons.—From *Apodemus agrarius coreae*, geographically adjacent to the north (specimens from various localities in central Korea), *A. a. pallescens* differs in: Dorsal coloration averaging drabber and paler, sides with less ochraceous wash; dark dorsal stripe paler and less distinct; size averaging slightly larger in both external and cranial dimensions. The skull of *pallescens* is very similar to that of *coreae*. From *Apodemus agrarius pallidior* of the Shantung Peninsula and adjacent coastal areas of North China (specimens from Tientsin, China), *A. a. pallescens* differs in: Larger in all external and most cranial dimensions; skull in general more robust; braincase deeper; dorsal color (compared with *pallidior* in winter pelage) less gray, dorsal stripe much less distinct. For comparisons with the mice of Quelpart Island, see the following account.

Remarks.—*Apodemus agrarius pallescens* is apparently the most drab-colored subspecies of the species in eastern Asia and can be distinguished from other described races on the basis of that character. A cline exists in the color of pelage of *Apodemus agrarius* from the subspecies *mantchuricus* of the forested mountainous areas of Manchuria (dark), southward to the coastal areas of the southern parts of Korea

(pale). We also note, to a lesser extent, a correlated increase in size. Thomas (1908:8) has described *coreae* from near the middle portion of this cline. The race *pallidus* here described represents the southern terminus of it.

A parallel cline, at least in color, appears to run westward from the range of *mantchuricus* to culminate in the pale race, *pallidus*, of north-eastern China.

Specimens examined.—Sixty-nine, all from Korea, as follows: 8 mi. SW Kunsan, 10 meters, 28 (USNM 299143-170); 5 mi. W Kwangju, 13 meters, 16 (USNM 299171-186); Mokp'o, 100-300 feet, 4 (British Museum 6.12.6.56-59); 5 mi. ENE Pusan, 2 meters, 16 (USNM 299187-201); Pusan, 5 (USNM 298164-167, British Museum 6.12.6.55).

***Apodemus agrarius chejuensis*, new subspecies**

Type.—Adult male in summer pelage, skin and skull, United States National Museum no. 299204, from 10 miles northeast of Mosulp'o, 420 meters, Cheju Do (Quelpart Island), Korea; obtained 7 September 1954 by George W. Byers, original no. 1641 of J. Knox Jones, Jr.

Distribution.—Known only from Cheju Do, Korea.

Diagnosis.—Upper parts dark ochraceous; underparts gray tinged with buff; dark dorsal stripe distinct; size large in all external measurements taken; skull large (especially in occipitonasal, basal and nasal lengths) and relatively massive.

Description.—Size: Larger than in any named subspecies of *Apodemus agrarius*; tail relatively long, but shorter than head and body; hind feet and ears large (see measurements). Color: Upper parts (summer pelage) between Ochraceous-Buff and Raw Sienna, moderately to heavily lined with black and giving an average overall glossy, dark-ochraceous appearance; sides somewhat lighter in color; dorsal stripe distinct, black; feet grayish above (except for white hairs surrounding nails), blackish below; ears blackish-brown with anterior fringe of orange-ochraceous hairs; tail indistinctly bicolor, blackish above, lighter below. Skull: Large (see measurements); nasals long; zygomatic and inter-orbital regions massive; zygomatic processes of maxillae and squamosals large; braincase deep and relatively narrow; rostrum long, relatively narrow across nasolachrymal capsules; supraorbital ridges well developed; incisive foramina long; mesopterygoid fossa wide, pterygoids divergent posteriorly; bullae moderately inflated.

Measurements.—External and cranial measurements of the type specimen, followed by average and extreme measurements of eight other adults (seven males and one female) from the vicinity of the type locality, are as follows: Total length, 221, 223.1 (216-232); length of tail vertebrae, 104, 102.6 (96-107); length of hind foot, 23, 24.0 (23-25); length of ear from notch, 15, 15.7 (15-17); occipitonasal length, 30.2, 30.1 (29.5-30.6); basal length, 25.6, 25.5 (25.0-26.3); zygomatic breadth, 13.6, 13.7 (13.0-14.4); interorbital breadth, 4.8, 4.8 (4.6-5.1); depth of braincase, 8.8, 8.5 (8.2-9.1); length of incisive foramina, 5.7, 5.8 (5.7-6.0); length of upper molariform toothrow, 4.4, 4.4 (4.2-4.5); length of nasals, 11.7, 11.5 (11.0-11.7).

Comparisons.—From *Apodemus agrarius pallescens* of the coastal areas of southern Korea, *A. a. chejuensis* differs in: Size, both external and cranial, much larger; upper parts, feet tail and ears darker; dorsal

stripe more distinct; underparts more buffy. *A. a. chejuensis* differs in most of the same features from *A. a. pallidior* of the Shantung Peninsula and from *A. a. mantchuricus* of Manchuria and *A. a. coreae* of central Korea. The dorsal coloration approaches that of *mantchuricus* but is richer and has a more cinereous appearance.

Remarks.—*Apodemus agrarius chejuensis* is larger, both externally and cranially, than any other described subspecies of *Apodemus agrarius* and is easily distinguished from the other known races. The rich, dark coloration of *chejuensis* seems to reflect the color of the dark, reddish volcanic soils of the island where it is found.

Thomas (1907:863) and Kuroda (1934:233) have previously reported specimens from Quelpart Island but neither separated them subspecifically from the adjacent mainland population. Lack of adequate comparative material and the small numbers of specimens available to them may explain the fact that these earlier workers failed to recognize this well marked insular race.

Specimens examined.—Thirty-one, all from Cheju Do, Korea, as follows: 2 mi. SE Mosulp'o, 3 meters, 3 (USNM 299220-222); 4 mi. E Mosulp'o, 100 meters, 5 (USNM 299215-219); 6 mi. NE Mosulp'o, 200 meters, 9 (USNM 299207-214 and 299627); 10 mi. NE Mosulp'o, 420 meters, 5 (USNM 299203-206 and 299626); 6 mi. NNE Sogwi-ri, 460 meters, 2 (USNM 299223-224); no exact locality, 3000-4500 feet, 7 (British Museum 6.12.6.5-11).

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